

# **International Earth Observing Constellations**



## **Operations Coordination Plan Status**

**Warren Case**

**Columbus Technologies, Inc.**

**Earth Science Mission Operations Project**

**NASA/Goddard Space Flight Center**

# **Afternoon Constellation MOWG 1<sup>st</sup> Meeting (Goddard Space Flight Center, March 2003)**



**MOWG was formed and began  
developing agreements and guidelines.**

## Operations Coordination Plan History (1 of 4)

YEAR	EVENT
<b>2002</b>	Landsat-7 and Terra publish their <i>Morning (AM) Train Coincident Observations Implementation and Operations Plan</i>
<b>2003 - 2004</b>	A-Train MOWG formed. Agreements developed between MOWG teams.
<b>2005</b>	A-Train MOWG published agreements: <ul style="list-style-type: none"> <li>• <i>Afternoon Constellation Operations Coordination Plan</i></li> <li>• <i>Afternoon Constellation Contingency Procedures</i></li> </ul>
<b>2008</b>	REVISION #1 published (A-Train missions only)
<b>2010</b>	<ul style="list-style-type: none"> <li>• A-Train / Landsat 5 passings highlighted the need for closer coordination between the 2 constellations.</li> <li>• Subsequent discussions at MOWG meetings reinforced the need for <i>one</i> MOWG and one set of agreements.</li> </ul>
<b>2011</b>	REVISION #2 published (still A-Train missions only)

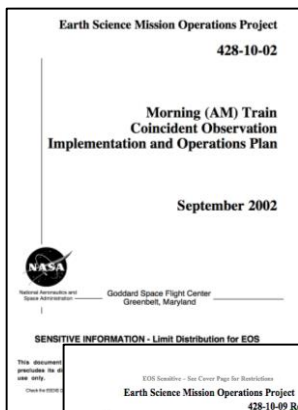


## Operations Coordination Plan History (2 of 4)

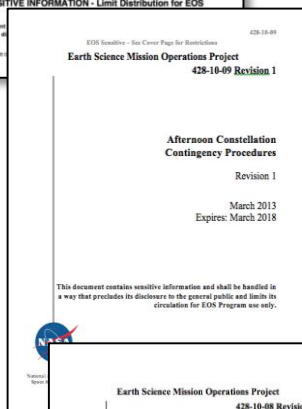
YEAR	EVENT
<b>2012 - 2013</b>	<ul style="list-style-type: none"> <li>• Extensive effort spent to standardize Definitions (e.g., <i>safe exit orbit</i>, <i>Constellation Envelope</i>, etc.).</li> <li>• <i>Ops Coordination Plan</i> and the <i>Contingency Procedures</i> merged. Document also expanded to encompass both the Morning and Afternoon Constellations.</li> <li>• Drafts issued to teams in July and December 2013.</li> </ul>
<b>2014</b>	<ul style="list-style-type: none"> <li>• April 11 – Updated document presented at MOWG meeting at GSFC.</li> <li>• July 21 – Interim update issued to add Morning Constellation and OCO-2 information</li> <li>• September 19 – Interim update issued to fix some orbital configuration entries in Table 2-3, Figure 2-2, and Section 2.2.</li> <li>• October 31 – Final document issued for signature approval. This contained some minor updates based on feedback received at the MOWG meeting in October 2014 at LaRC.</li> </ul>

## Operations Coordination Plan History (3 of 4)

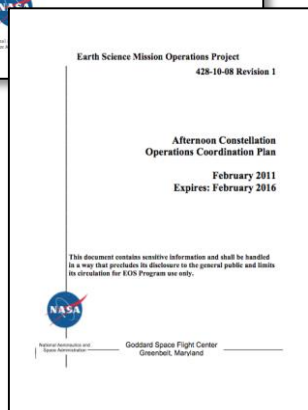
### *Merging documents*



***Morning (AM) Train Coincident Observations Implementation and Operations Plan (September 2002)***

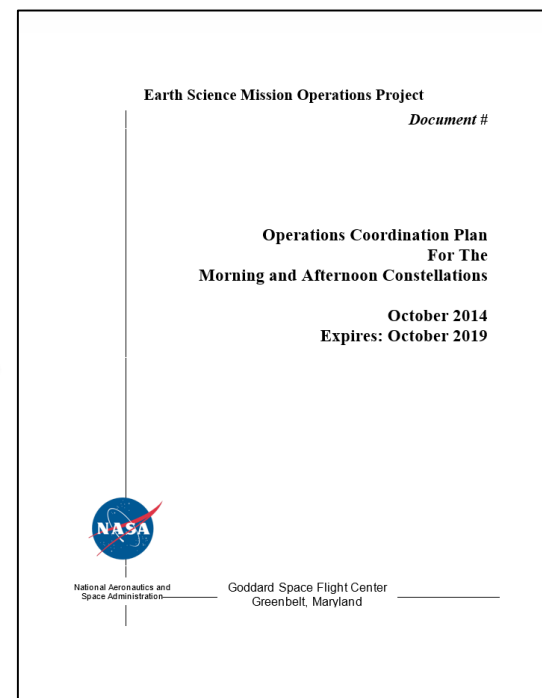


***Afternoon Constellation Operations Coordination Plan (February 2011)***



***Afternoon Constellation Contingency Procedures (February 2011)***

**Merged document**



***“New” Operations Coordination Plan (October 2014)***

## Operations Coordination Plan History (4 of 4)

YEAR	EVENT
2015	<ul style="list-style-type: none"><li>• March – Final signature received from the mission teams</li><li>• March 31 – Document submitted to ESM Configuration Management process</li><li>• <b>TBA</b> – Document approved and distributed to all teams</li></ul>

***Thank you!***

# Summary of Changes Since 2011

- **Document reorganized:**
  - Sec. 1 – *Constellation Coordination*
  - Sec. 2 – *Afternoon Constellation*
  - Sec. 3 – *Morning Constellation*
- **Sections updated** (*see next 2 slides*)

## Section 1 – *Constellation Coordination*

- Section 1.1 (“*Purpose*”): Rewritten to include both constellations
- Section 1.3 (“*Definition of Terms*”): Replaced with definitions developed during spring/summer 2013 and reviewed at the MOWG meeting in September 2013.
- Section 1.4 (“*Documentation*”): Updated with the latest Applicable and Reference document versions.
- Section 1.5 (“*Operations Coordination*”): Added CARA and CAESAR references .
- Section 1.6 (“*Constellation Coordination Concepts and Guidelines*”): Added CARA to Figure 1-1.
- Section 1.8 (“*Anomaly and Conflict Resolution Process*”): Modified the conflict escalation flow to account for inter-constellation and Morning Constellation conflicts by adding Figures 1-2 and 1-4.
- Section 1.9 (“*Constellation Exit Planning*”): Added paragraphs for trigger events and for the disposition of CCS historical data.
- Section 1.11 (“*Contingency Procedures*”): This section provides the overview previously contained in the *Afternoon Constellation Contingency Procedures* document, plus 3 contingency procedures (in 1.11.2, -.3, and -.4) that affect both constellations. Note that the remaining contingency procedures are found later in the document (in Section 2).



## Section 2 – *Afternoon Constellation*

- Section 2.1 (“*Afternoon Constellation Coordination*”): The science and operations leads were updated.
- Sections 2.2 – 2.3 were updated to reflect changes to the Afternoon Constellation since 2011
  - PARASOL’s exit
  - GCOM-W1 launch, ascent, and entry into the A-Train
  - CloudSat’s Do-Op operations
  - Aqua/Aura’s no-yaw maneuvers
  - OCO-2 launch, ascent, and entry into the A-Train

## Section 3 – *Morning Constellation*

- All sub-sections: All new text was added with Morning Constellation information

# Summary

- Updating the *Plan* required the support of all Constellation teams.
- It has been well worth the effort. The *Plan* now *reflects our collective understanding* and *documents the agreements* we use to fly safely.

***We appreciate your time and effort.  
Thank you!***

*Arigatou Gozaimasu*

*Merci*

*Thank you*

**Questions?**